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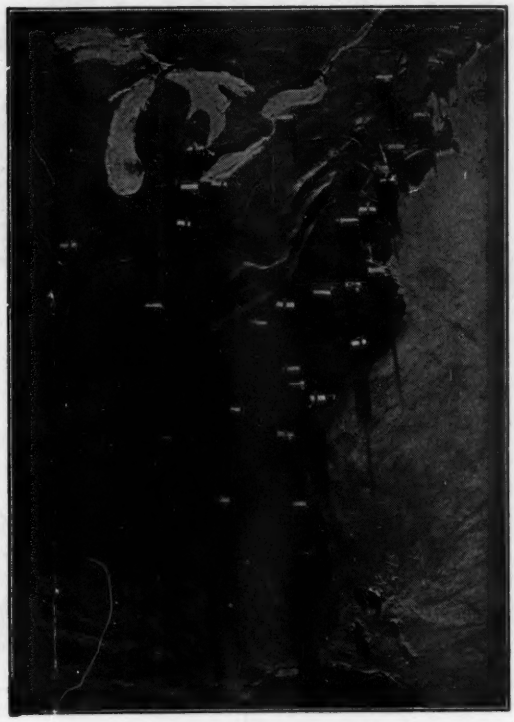

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...THE...

AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

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Putting Fertilizer Down Puts Crops Up*

By A. W. KLEMME

Extension Specialist in Soils. Dept. of Soils, University of Missouri

ACCORDING to many field trials in Missouri, the application of commercial fertilizers can be expected to give profitable returns. These come as larger yields and better quality of small grains and grasses, both of which make most of their growth in the fall and early spring in the longer growing season as we have it in this State. This is also in accord with the more favorable distribution of rainfall. On late spring and summer-growing crops, like corn and soybeans, the response to fertilizers in this State has been erratic. These crops may meet less favorable distribution of rainfall.

Row applications of 150 pounds per acre on corn with a modern fertilizer attachment on the planter will increase corn yields from 5 to 12 bushels per acre in years when the rainfall is well distributed throughout the growing season. On the other hand, yields may be decreased in seasons with short droughts, especially if these occur during the tasseling and silking stage.

The erratic response from year to year is illustrated in the yield records of fertilizer test plots on corn. In 1937, the plots on Oswego silt loam, a gray prairie soil of southwest Missouri, were given an application of 150 pounds of a 4–12–4 fertilizer in continuous bands on each side of the row. They yielded 5.1 bushels more corn per acre than the plots receiving no fertilizer. In 1938 the same fertilizer gave no increase in yield. On Marshall silt loam in 1937, the application of 150 pounds of 0–12–4 per acre increased the yields by 9 bushels per acre, while in 1938 the plots with a like application yielded less corn per acre than the plots receiving no fertilizer. These erratic responses to fertilizers by the corn crop usually have been charged to weather conditions.

It has been generally believed that if droughty periods and hot winds occur when the corn is tasseling and silking, the viability of the pollen is damaged and corn yields are reduced. In general, it has been believed that fertilizer applications may hasten growth so as to bring corn into the tasseling stage when such droughts occur; and, if so, that yields are not increased or may even be reduced by fertilizers. Contrariwise, there is ample evidence to show that fertilizers may hasten development so as to escape this critical period, and yields may be increased.

Recently some more helpful concepts of this erratic response of summer-grown crops to fertilizers applied in the row have been suggested. Fertilizers remaining in the soil as salts, it is believed, may be the cause of such crop injury. There is further suggestion that when adsorbed on the soil they are helpful. It has been pointed out by Albrecht[1] that fertilizer nutrients or salts must first react chemically with the colloidal material of the soil if they are to become most serviceable to plants. When the fertilizer is applied in concentrated areas as in row applications, only a portion of the ions of the fertilizer salts react rapidly and become more completely absorbed by the soil. The balance remains as a salt to give a strong solution injurious to the tender plant root. When fertilizer is drilled with fall-sown small grain the cooler, more moist, and longer growing season allows chemical reaction to become more complete before the slowly advancing roots meet the unadsorbed salts. This serves to reduce the salt effect and to make the nutrient ions more effectively avail-

*Reprinted from *"Better Crops with Plant Food."*

[1]Albrecht, William A. *Adsorbed Ions on the Colloidal Complex and Plant Nutrition.* Proceeding Soil Science Soc. of America 1940, Vol. 5, pages 8–16.

able so that the crop response is more certain.

In midsummer when short droughts occur, the feeding roots of the plant move downward to moisture. In most Missouri soils there are less available nutrients in the subsurface and subsoil zones than in the surface soil. It is during these periods when the need of the plant for soil nutrients is often greatest. The so-called "firing" of corn which occurs during these periods may in many cases really be starvation for the essential plant nutrients. Scarseth[2] of the Indiana Agricultural Experiment Station has shown that in Indiana, where weather conditions are not so variable, the "firing" of corn can be reduced and yields can be increased by broadcasting and plowing under a part of the fertilizer, or by placing it lower down or on the plow sole with a special fertilizer attachment on a plow.

An exploratory study of fertilizer placement on corn was started in Missouri in 1941, in cooperation with the Midwest Fertilizer Committee and the American Potash Institute. It was designed to test this belief that "firing" of corn was a matter of plant-food deficiency and, further, that the fertilizers placed so as to allow them to be absorbed by the soil would be more effective than if too near the seed and early roots. Eight cooperative test plots on different farms were established with one each on the silt loams of the soil series of Marshall and of Knox, the two more fertile loess soils of northwest Missouri; of Summit, a residual prairie limestone and shale soil of central Missouri; and of Wabash, along the Mississippi River in northeast Missouri; and with four on Putnam silt loam, a typical claypan prairie soil of northeast Missouri. The fields taken over in all of the selected areas except three were in second-year sweet clover just before going to corn. One of the exceptions was a field in red clover sod, another was in small grain and lespedeza, and the third had been in corn the previous year.

In order to put the fertilizer down, it was broadcast with a fertilizer grain drill and plowed under with a tractor plow. On those soils that are relatively high in organic matter such as the Marshall, Knox, Wabash, and Summit silt loams, the broadcast applications were 400 pounds per acre each of 0–20–0 and 0–20–20. Two additional plots were added on three of the test areas on the gray prairie soils. On one, there was applied an equivalent of 800 pounds per acre of 10–10–10 fertilizer; on another 400 pounds of sulphate of ammonia were plowed under. Across these broadcast applications that went down into the soil, some fertilizer was applied in the row as a contrasted surface application with a modern corn-planter attachment. The fertilizer grades and rates per acre in the row applications were approximately 0–20–0 at 80 pounds, 4–16–4 at 100 pounds, and 3–12–12 at 133 pounds.

Because of the excessive rainfall during the late spring, of severe insect damage by the Grape calapsis, and of the severe drought late in the season, complete data as to yield from all these plots were not obtained, but some interesting observations were made. The insect damage was less severe and the growth was larger and more vigorous on plots that had plowed-under, broadcast, or row applications of the 10–10–10, 0–20–20, and /or the sulphate of ammonia than where no fertilizer was used or where it was put on in the row applications. The latter type of application, however, caused the corn to grow more rapidly at first. Harvest records where taken showed little differences in yields for any of the plots.

TABLE I

EFFECTS OF FERTILIZERS BROADCAST AND PLOWED UNDER FOR CORN IN 1941 AS THEY CARRIED OVER TO MODIFY THE YIELDS OF THE CORN CROP IN 1942.

Grade and Rate /Acre	Bu. /Acre
None	41.5
400 lbs. sulphate of ammonia	60.0
800 lbs. 10–10–10	61.0
400 lbs. 0–20–20	54.5
400 lbs. 0–20–0	53.5

The plots receiving the 10–10–10 fertilizer plowed under withstood the drought for 10 days to 2 weeks longer without serious "firing" than did the plots receiving fertilizer in the row, or those which received no fertilizer. The quality of corn produced from all plots, except those receiving sulphate of ammonia alone, was superior to that of corn grown on those receiving no fertilizer.

That there were residual effects from fertilizers used in 1941 passed on to the succeeding crops in 1942 was shown by their increased growth and vigor. Yield data were obtained from corn following corn on one area of Putnam silt loam on the Raymond Brown farm in Audrain County. The sweet clover and the fertilizers were plowed under and planted to corn in 1941. This area was planted to corn again in 1942 in order to test the carryover of fertilizer after one crop of corn had taken its toll. The results as corn yields in the second crop are given in Table I.

[2]G. D. Scarseth. Agronomy Mimeo. No. 36. Purdue University, Agri. Ext. Station, Department of Agronomy.

These yields of corn and the difference in crop growth with serious or less serious "firing" during the summer all point to the fact that the corn crop was pushed up as the fertilizer was put down into the soil by plowing it under, rather than by leaving it in the surface as the row placement locates it. Such results from the immediate crop and the effects as carryover to the succeeding crop all support the belief that "firing" by row placement may be a kind of salt effect, or bad placement, in the dry-soil layer that lets the crop start off well but starves it later when the active roots are down in the deeper but nutrient-deficient areas of the soil. Plowing the fertilizer under puts it into the region where it is changed from the salt to the adsorbed condition. It appears to be good soil chemistry and good plant physiology as well as good farm economy.

In further test of the idea of absorbing the fertilizers on the soil before the plant roots get to them, two additional trials on fertilizer placement were started in the spring of 1942. One was with soybeans on Gerald silt loam, a claypan soil of southwest Missouri, the other was with corn on Oswego silt loam in the same part of the State. The field layout was much the same as used formerly except that all the treatments were applied in the same direction.

TABLE II

YIELDS OF SOYBEAN GRAIN ON GERALD SILT LOAM, ACCORDING TO DIFFERENT AMOUNTS OF FERTILIZER, WERE PLOWED UNDER ON LIMED OR UNLIMED SOILS.

Grade and Rates /Acre	Bu. /Acre Limed	Unlimed
None	17.3 bu.	10.0 bu.
200 lbs. 0–20– 0	12.5 [1]	15.0
400 lbs. 0–20– 0	19.3	12.8
200 lbs. 0–20–10	26.5	19.0
400 lbs. 0–20–10	23.3	14.8
200 lbs. 0–20–20	23.6	
400 lbs. 0–20–20	25.6	
250 lbs. 4–16– 4	20.5	15.4
500 lbs. 4–16– 4	21.0	14.4

[1]One row was a border row.

The fertilizers used on both plow-down and row-application plots of the soybeans were 0–20–0, 0–20–10, 0–20–20, and 4–16–4. The rates of applications for the plow-down tests were 200 and 400 pounds per acre except for the 4–10–4 which were 250 and 500 pounds per acre. The same fertilizers were used on the corn plots except that equivalent applications of 2–12–6 were substituted for the 4–16–4. A portion of the soybean field had been limed in 1939. The entire field had grown wheat-lespedeza in 1940 and 1941. The corn field had been limed in 1939 and had grown sweet clover which was plowed down ahead of the corn.

Row applications of 200 pounds of 0–20–0, 0–20–10, and 0–20–20 and 250 pounds per acre of 4–16–4, or 333 pounds of 2–12–6, were made with a modern fertilizer-planter attachment in case of the soybean land on both the limed and unlimed areas and on the corn. The fertilizers for deeper applications were broadcast with a fertilizer grain drill and plowed under immediately with a tractor plow.

Scioto soybeans planted on May 27th and 28th gave an excellent stand on this Gerald silt loam. The crop was harvested with a combine on October 16th. Where the fertilizers were plowed under yield results were those in Table II.

Even without the use of fertilizers, the yields of soybeans on the limed land were larger by 7.3 bushels than on the unlimed land. On the unlimed land, the plowing under of the 0–20–10 fertilizer gave 6.9 more bushels of beans per acre. On the limed land, the increase from plowing was over 8 bushels per acre. Nitrogen in the fertilizer had a tendency to delay maturity, but to a lesser extent on the limed land. Nevertheless, the beans from all the plots contained less than 12 per cent moisture.

TABLE III

YIELDS OF SOYBEAN GRAIN (BUSHELS /ACRE), ACCORDING TO THE FERTILIZER, WERE PLOWED UNDER OR APPLIED AS BANDS ALONG THE ROW ON LIMED OR UNLIMED SOIL.

Grade and Rate /Acre	Plowed Under	Bands
Limed		
None	17.3 bu.	17.3 bu.
200 lbs. 0–20– 0	19.3*	18.6
200 lbs. 0–20–10	26.5	17.4
Unlimed		
None	10.0 bu.	10.0 bu.
200 lbs. 0–20– 0	15.0	12.8
200 lbs. 0–20–10	13.0	10.7

*Weight included border row and could not be used. Yield record given is for 400 pounds broadcast and plowed under.

In the similar study with corn in 1942, the plowing under of 200 pounds of 0–20–20 fertilizer per acre on second-year sweet clover land ahead of corn was responsible for an increase in yield of nearly 9 bushels per acre on Oswego silt loam. Similar applications put on the side of the row at corn planting time with a modern corn planter attachment failed to increase the yield materially. The corn receiving applications of fertilizer in the row grew more rapidly at the outset but failed to produce the yield

(Continued on page 26)

Ammonium Nitrate as a Source of Nitrogen for Potato Fertilizers

By BAILEY E. BROWN[1]

MUCH interest is being shown just now in ammonium nitrate, as is indicated in a recent article by Parker and Ross (*4*).[2] In their article the writers discuss the potentialities of ammonium nitrate for fertilizer purposes and what is being attempted to reduce its tendency to absorb moisture and to cake.[3] They point out that:

"Ammonium nitrate is now available for fertilizer purposes from private and war plants. Increased supplies will be available in future years, for ammonium nitrate is the form of nitrogen war plants produce that can be readily used in fertilizer. Its effective use is a problem the industry will face next year and in the years to follow."

In view of a number of inquiries from potato growers as to the plant-food merits of ammonium nitrate, it is thought desirable to compile available data obtained in potato fertilizer experiments[4] in a single article. The results have been presented previously (*1*, *2*,

TABLE I. POTATO YIELDS IN NITROGEN-SOURCE FIELD TESTS ON PROMINENT POTATO SOILS

Source of Nitrogen Used in Complete Fertilizer[1]	Location, Variety Grown, and Number of Tests							
	Maine (Aroostook Co.) *Cobbler* 6 tests (1921–1926)	New York (Long Island)[2] *Green Mountain* 3 tests (1921–1923)	New York (Long Island)[2] *Cobbler* 2 tests (1924–1925)	Pennsylvania (Cambria Co.) *Russet Rural* 5 tests (1927–1931)	Pennsylvania (Mercer Co.) *Russet Rural* 4 tests (1928–1931)	Pennsylvania (Lehigh Co.) *Russet Rural* 3 tests (1927, 1930, 1931)	Virginia (Eastern Shore)[3] *Cobbler* 4 tests (1922–1925)	Average of all 27 tests
	Average bushel per acre	Average bushel per acre	Average bushel per acre	Average bushel per acre	Average bushel per acre	Average bushel per acre	Average bushel per acre	Bushels per acre
Ammonium nitrate	311	262	276	203	261	193	169	241
Ammonium sulphate	290	237	255	199	271	204	174	235
Ammonium chloride	311	247	263	208	251	197	161	237
Sodium nitrate	279	263	250	203	257	213	154	232
Urea	313	259	267	188	252	191	181	238
Fertilizer used	4–8–8	4–8–8	4–8–8	4–8–8	4–8–8	4–8–8	6–8–6	
Rate applied per acre	1800 lb.	1800 lb.	1800 lb.	800 lb.	1800 lb.	1200 lb.	1800 lb.	
Soil type	Caribou loam	Sassafras loam	Sassafras loam	Muskingum stony loam	Volusia silt loam	Berks shale loam	Sassafras sandy loam	

[1] Other ingredients in fertilizer included ordinary superphosphate as the source of phosphoric acid (P_2O_5) and potassium sulphate as the source of potash. Sand was used as filler. No limestone was included in any mixture.

[2] Suffolk County. [3] Northampton County.

[1] Senior biochemist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture.

[2] Italic numbers in parentheses refer to the literature cited at the end of the paper.

[3] The main problem connected with the effective use of ammonium nitrate for fertilizer purposes is how to get it into good physical condition and keep it so. Its well-known tendency to absorb moisture from the air presents a distinct problem to the fertilizer industry and home mixer. The problem, and what is being done to solve it, is fully discussed in the above-mentioned article in THE AMERICAN FERTILIZER.

[4] Results obtained from field studies conducted cooperatively by the U. S. Department of Agriculture and the Maine, New York (Cornell), and Pennsylvania Agricultural Experiment Stations, and the Virginia Truck Experiment Station.

3), but the publications in which they appeared are practically out of print.

Present Report

The results presented herein were obtained in widely separated field comparisons of ammonium nitrate, ammonium sulphate, ammonium chloride, sodium nitrate, and urea as sources of nitrogen in potato fertilizers. A total of 27 tests were made. Average results for a number of important potato-producing areas have been assembled in Table I, along with information concerning location of tests, soil type, variety grown, and other essential information.

Discussion of Results

The results presented in Table I require very little discussion. This is particularly the case if one chooses to compare the combined results of all tests in terms of weighted averages. On this basis the yields ranged from 232 bushels per acre for the sodium nitrate mixture to 241 bushels for ammonium nitrate. In between these came ammonium sulphate, 235 bushels; ammonium chloride, 237 bushels; and urea, 238 bushels. These, admittedly, are very closely agreeing results.

Very little work, besides that reported herein, appears to have been done to evaluate ammonium nitrate as a source of nitrogen for potato fertilizer. The only reference to such work that could be located was a nitrogen-source study made by Wessels and White-Stevens (5). These investigators found that under Long Island conditions ammonium nitrate rated first as a source of nitrogen for potatoes, based on a 3-year study (1935–37). Cobblers were grown in their tests, and a 5–8–5 fertilizer was used at the rate of 2,000 pounds per acre. The average yield reported by them for the 3-year period was 268 bushels per acre for ammonium nitrate; 260 bushels for urea; 257 bushels for ammonium sulphate; and 254 bushels for sodium nitrate.

Summation

Twenty-seven field tests were made to compare ammonium nitrate with ammonium sulphate, ammonium chloride, sodium nitrate, and area as sources of nitrogen for potato fertilizer. The net result showed that ammonium nitrate rated first, although the yield increase over the ammonium sulphate, ammonium chloride, sodium nitrate, or urea mixture was comparatively slight. The value of ammonium nitrate as a source of nitrogen in potato fertilizers has been amply shown by these, and other reported investigations.

It is apparent, therefore, that the main problem connected with the use of the material for fertilizer purposes is not an agronomic one, but rather one of getting it into such shape that the absorption of moisture is retarded sufficiently to render ammonium nitrate usable in complete fertilizers and for top- or side-dressing purposes. At the present writing considerable progress is reported as being made in this direction.

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(2) Brown, B. E., Owen, F. V., and Tobey, E. R., 1930. "Sources of Nitrogen for Potato Fertilizers in Aroostook County," Maine Agr. Expt. Sta. Bul 354, 38 pp., illus.

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(4) Parker, F. W., and Ross, W. H., 1943. "Problems in Formulating Fertilizers for 1943–44," AMERICAN FERTILIZER, Vol. 99, issues of July 3 and July 17.

(5) Wessels, P. H., and White-Stevens, R. H., 1938. "Various Sources of Nitrogen for Potatoes and Spinach Production on Long Island," Proc. Amer. Soc. for Hort. Sci. 36:593–396.

Brothers in Confusion

It seems that the United States is not the only nation in which farmers are frequently at a loss to translate government fertilizer regulations into terms which are used in everyday transactions. In a recent issue of *The Fertiliser Journal* (England), an article entitled "The Clash of Symbols" by "Micawber" recites the woes of the English farmer and fertilizer dealer in dealing with chemical terms for plant food instead of the common trade names. The confusion is heightened by the fact that most fertilizer in England is purchased in the form of raw materials, rather than as mixtures calling for a guaranteed analysis.

When confronted with a permit calling for so many pounds of P_2O_5 and K_2O, one farmer asked his local merchant "Here, what does this P. & O. business mean? If you can wangle it, I'd like some basic (basic slag); that always does well on my land, but I don't like trying new-fangled things like P_2O_5, especially in war-time."

Fertilizer Used on Cotton

An Estimation Compiled by the U. S. Department of Agriculture

State	Acres in cultivation July 1		Percentage of acres receiving fertilizer		Acres receiving fertilizer		Fertilizer applied per acre when used	
	1942	1943	1942	1943	1942	1943	1942	1943
	Thousands		Per Cent		Thousands		Pounds	
Missouri	426	375	20	27	85	101	155	160
Virginia	41	35	99	99	41	35	450	475
North Carolina	861	865	99	99	852	856	460	475
South Carolina	1,153	1,140	98	99	1,130	1,129	435	470
Georgia	1,735	1,580	99	99	1,718	1,564	335	365
Florida	59	47	96	96	57	45	305	315
Tennessee	725	720	62	70	450	504	215	230
Alabama	1,722	1,570	98	98	1,688	1,539	335	375
Mississippi	2,438	2,480	68	78	1,658	1,934	210	235
Arkansas	2,021	1,920	58	58	1,172	1,114	175	175
Louisiana	1,028	1,010	60	66	617	667	180	195
Oklahoma	1,872	1,580	1	1	19	16	125	125
Texas	8,430	8,050	5	5	422	402	170	175
All Other*	791	623	..	..	69	71	180	195
United States	23,302	21,995	42.8	45.4	9,978	9,977	292.8	312.1

State	Total fertilizer used on cotton		Average price of fertilizer per ton		Total cost of fertilizer used on cotton		Average cost of fertilizer per acre when used	
	1942	1943	1942	1943	1942	1943	1942	1943
	Tons		Dollars		Thousand dollars		Dollars	
Missouri	6,588	8,080	39.00	39.00	257	315	3.02	3.12
Virginia	9,225	8,312	27.00	30.00	249	249	6.08	7.12
North Carolina	195,960	203,300	28.50	30.50	5,585	6,201	6.56	7.24
South Carolina	245,775	265,315	28.50	30.50	7,005	8,092	6.20	7.17
Georgia	287,765	285,430	29.25	31.00	8,417	8,848	4.90	5.66
Florida	8,692	7,088	29.50	31.00	256	220	4.50	4.88
Tennessee	48,375	57,960	31.00	33.50	1,500	1,942	3.33	3.85
Alabama	282,740	288,562	30.25	32.50	8,553	9,378	5.07	6.09
Mississippi	174,090	227,245	34.00	35.00	5,919	7,954	3.57	4.11
Arkansas	102,550	97,475	36.00	37.50	3,692	3,655	3.15	3.28
Louisiana	55,530	65,032	35.25	37.00	1,957	2,406	3.17	3.61
Oklahoma	1,188	1,000	32.00	32.00	38	32	2.00	2.00
Texas	35,870	35,275	33.00	33.75	1,184	1,187	2.80	2.95
All Other*	6,275	6,963	53.25	48.50	334	337	4.84	4.75
United States	1,460,623	1,556,937	30.77	32.64	44,946	50,816	4.50	5.09

*Includes New Mexico, Arizona, California, Illinois, Kansas, and Kentucky.

SALES OF FERTILIZER IN COTTON STATES FOR ALL PURPOSES

(Tonnage shown is based on sales of fertilizer tags.)

State	Beginning	Ending (in year shown)	Sales 1941	Sales 1942	Sales 1943
			Tons	Tons	Tons
Virginia	July 1	June 30	400,047	416,231	424,827
North Carolina					
Commercial	July 1	June 30	1,113,325	1,194,175	1,292,655
Cottonseed Meal	July 1	June 30	128,254	96,831	128,631
South Carolina	July 1	June 30	712,258	658,812	802,498
Georgia	July 1	June 30	748,526	789,893	988,192
Florida	July 1	June 30	523,808	601,485	618,261
Tennessee	June 1	May 31	147,904	160,634	216,750
Alabama	Oct. 1	June 30	570,450	567,200	631,200
Mississippi					
Commercial	July 1	June 30	342,454	344,687	428,574
Cottonseed Meal	July 1	June 30	93,802	98,700	139,805
Arkansas	Jan. 1	May 31	111,250	125,550	140,975
Louisiana	Sept. 1	May 31	168,824	161,886	179,943
Oklahoma	July 1	June 30	10,790	11,386	16,494
Texas	Sept. 1	May 31	131,678	130,623	149,466
Total			5,203,370	5,358,093	6,158,271

Fertilizer Advisory Committee

The Fertilizer Industry Advisory Committee met on August 18th, P. H. Groggins, U.S.D.A., presiding. The following members of the Committee were present: J. E. Barnes (for H. M. Albright), George Cushman, M. K. Derrick, R. B. Douglass (for O. F. Smith), N. E. Harman, S. B. Haskell, M. H. Lockwood, John A. Miller, John L. Morris (for Wm. B. Tilghman), Ira E. Moss (for C. D. Shallenberger), J. Rucker McCarty (for Franklin Farley), M. H. McCord (for C. F. Hockley), Weller Noble, O. J. Noer, John E. Sanford, F. J. Woods, and J. A. Woods. Others present include: M. Lee Marshall, deputy administrator, WFA; D. W. Aitken, R. O. E. Davis, N. E. Dodd, W. G. Finn, O. S. Fisher, A. C. Howard, T. L. Jeffries, P. V. Kepner, W. E. Lafkin, Harold Lewis, A. L. Mehring, J. E. Nunnally, O. E. Overseth, L. G. Porter, J. H. Stallings, W. F. Watkins, George M. Worman, U.S.D.A.; J. C. Freeman, C. G. Gran, W. T. Hart, Henry A. Huschke, P. W. Lowry, Roland Payne, OPA; R. R. Hull, Dale C. Kieffer, Edmund Rowland, H. V. B. Smith, WPB; and D. S. Murph, NFA.

Mr. Marshall emphasized the essentiality of the fertilizer industry in food production. The supply and demand situation with respect to materials was presented by Government officials and in reports by the appropriate subcommittees. With respect to superphosphate: Reference was made to the meeting of the WPB Superphosphate Producers Industry Advisory Committee on August 3. WPB pointed out that arrangements are nuder way for distribution of ordnance acid in the Copper Hill area through an experienced trade channel. It seems likely that production, expanding at the presently indicated rate, for use this year will be in the neighborhood of 7,000,000 tons of 18 per cent superphosphate. To produce in excess of 7,500,000 tons this year would require a plant expansion program, for which it might be difficult to obtain WPB approval under present conditions. In view of labor conditions, WPB is preparing to request permission for superphosphate producers, as well as manufacturers of mixed fertilizer, to pay wages up to 50 cents an hour without prior approval by the War Labor Board. AAA officials stated that in the interest of soil conservation and increased food production they were ready to buy, for distribution to farmers, all the superphosphate which the regular trade would not take; that AAA has no interest in getting into the fertilizer business but feels that it can contribute to food production by promoting the use of superphosphate through educational work and through distribution of surplus supplies. It is felt that as much as approximately 4,000,000 tons could be distributed in this way with good results.

Nitrogen

As to nitrogen, it was reported that the revised estimate of supplies, including organics, still stands at 700,000 tons of nitrogen, but that this includes 685,000 tons of Chilean nitrate of soda though arrangements have not yet been completed for bringing in this quantity. The WFA estimate of national requirements also stands at about 700,000 tons. WPB pointed out that the total amount of nitrogen each fertilizer manufacturer will get will depend on his ability to use ammonium nitrate and solutions. So far this year, ammonium nitrate has been used at the rate of about 15,000 tons a month, which is about three-fourths of capacity. To secure maximum utilization, the inorganic nitrogen subcommittee recommended definite and prompt improvement in the material; that the producers be required to assume responsibility to the extent of making individual adjustment to buyers covering such items as arrival in wet condition or in cement-hard condition, extraordinary breakage of bags, and the like; that because of deterioration-in-storage risks the fertilizer industry should not be asked to handle the material for direct use on the same basis of compensation as it handles other top- and side-dressing materials. The subcommittee also recommended that, in order to find a use within the six-months' period beginning September 1st for some 40,000 tons which may not go into mixed fertilizer (1) in Southern regions, having need for fall and winter pasturage, attempt be made through State Experiment Stations and Extension Services to secure wide use of ammonium nitrate for top dressing; (2) that a similar program be developed with respect to buckshot soils in the Mississipi Delta; and (3) that restrictions on use, as represented by "A"

(Continued on page 24)

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Principal Articles in This Issue

WFA Requests Chilean Nitrates Tonnage

The War Production Board has been asked by the War Food Administration to give its approval to a program for the importation of 1,000,000 tons of Chilean nitrates for the coming year, but officials are exceedingly skeptical that such a program will be approved.

The basis for the skepticism is grounded, it was indicated, on the fact that there is too much room for argument over the question whether such a supply of nitrates in addition to the available supplies of the new synthetic nitrogen material, ammoniated nitrate, is necessary or could be efficiently utilized in the farming activities of the country as the 1944 food program is now envisioned.

To make use of this amount of Chilean nitrate, plus the available supplies of ammoniated nitrate, it was stated, would make it necessary for the government to go all-out on a program of food production and vastly increasing the acreage proposed to be devoted to food and fiber crops.

Reports that the War Food Administration was recommending a reduction in the amount of nitrates to be brought in from Chile were flatly denied. The request that permission be granted to bring in 1,000,000 tons was made by the WFA to WPB several months ago, and so far as WFA officials know that is where the matter now rests. They expressed the belief that the question of the amount to be imported eventually may have to be decided by James F. Byrnes, Economic Stabilization director.

That a reduction in the imports is not ta all unlikely, arising out of the fact that no decision yet has been forthcoming, however, has been sufficient to bring protests from the National Cotton Council. Oscar Johnston, president of the council, in a letter to War Food Administrator Marvin Jones, predicted that unless provision is made for importing 1,000,000 tons of nitrates from Chile next year, the food and fiber production program of 1944 is threatened with a major catastrophe from a shortage of usable nitrogen.

Mr. Johnston said that practical obstacles stand in the way of efficient and satisfactory use of ammoniated nitrate as a substitute for the Chilean nitrate, the most important being the unfamiliarity of the farmers with its use. If the farmers are forced to use it, he declared, such use will of necessity be largely uncer-

tain and experimental, with potentially drastic effect on 1944 crops.

Some of the government officials were inclined to agree with the argument of Mr. Johnston on the difficulties of making the farmers understand the difference between the synthetic product and the natural nitrates. A bag of fertilizer is just a bag of fertilizer to many farmers irrespective of the nitrogen content, they pointed out.

But, they continued, if the situation is looked at purely from the standpoint of nitrogen supplies and the need for nitrogenous fertilizers, it would be difficult to justify the importation of as much as 1,000,000 tons of the nitrates from Chile. There is considerable production of ammoniated nitrates both in Canada and United States available for fertilizer use and if the 1,000,000 tons of the Chilean nitrates were added to this supply, there would be a problem of how to use it all up.

The government could lay out a program that would show where the nitrates should be used, but putting such a program into actual practice is something else again, they said.

Obituary

BERNARD O. GRAVES

Bernard O. Graves, president of Hollingshurst & Co., Inc., New York, well known importers and brokers of fertilizer materials and chemicals, died at his home in Jackson Heights, Long Island, on August 9, after a prolonged illness.

Mr. Graves, who was 58 years of age at the time of his death, was born in England and started his business career with Hollingshurst & Co., Ltd., of London. In 1910 he was sent to this country to open a New York office for his Company. In 1938, when the parent firm was liquidated, Mr. Graves acquired the title and the business of the New York office and continued under the firm name of Hollingshurst & Co., Inc.

The passing of "Barney" Graves, as he was known to a host of friends, is a great loss to the fertilizer industry and his cheerful personality will be missed at the gatherings of fertilizer executives in the days to come.

R. D. PURINTON

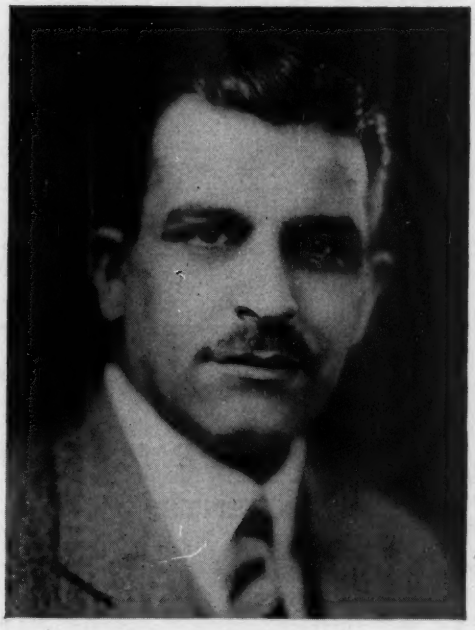
R. D. Purinton, assistant treasurer of Sagadahoc Fertilizer Co., Bowdoinham, Maine, died on July 14th, aged 78 years. In 1885 he entered the employ of the company and continued with this concern for 58 years, which establishes somewhat of a record for continuous service with one fertilizer company. During his career he was at various times manager, plant superintendent and, for the past several years, an officer and director. He is survived by his widow, Margaret H. Purinton.

Gabeler Appointed Vice-Presid nt of Summers Fertilizer Co.

William H. Gabeler has been appointed Vice-President of the Summers Fertilizer Company of Baltimore, Md., according to announcement made by J. E. Totman, President.

Mr. Gabeler will be located at the main office of the Company in the Stock Exchange Building, Baltimore, where he will be in charge of the Company's development of its chemical and food processing plans.

Mr. Gabeler, prior to joining the Summers' Organization, was Assistant Vice-President of the Davison Chemical Company in Baltimore with whom he was associated for more



William H. Gabeler

than 23 years. Mr. Gabeler, after attending the Massachusetts Institute of Technology, spent two years in Canada in the construction of hydro-electric plants for the Shawinigan Water and Power Company, and the Montreal Light and Power Company. He started in the chemical field with the Barrett Company, at Everett, Mass., as Assistant Superintendent in charge of that plant's operations. He left there to join the Air Forces of the A. E. F. of the first World War. After the war, he became associated with the Davison Chemical Company at Baltimore where his long experience in operations and in the development of processes in the metallurgical and chemical fields, covering the manufacture of sulphuric acid, phosphoric acid, superphosphate, fertilizers, fluoride salts, silica gels, and the dehydration of gels, has admirably fitted him for his new connection.

July Tax Tag Sales

Due in considerable part to increased sales in the Midwest in anticipation of a large fall tonnage, sales of fertilizer tax tags in July were at an abnormally high level. Fertilizer consumption in July is very small; tag sales during the month represent to a large extent anticipation of fertilizer sales in the fall.

Total sales in July in the 17 reporting States represented 158,051 equivalent tons, compared with 83,804 tons in July, 1942 and 68,239 tons in July, 1941.

Sales in the first seven months of this year in the 17 States totaled 5,550,864 tons, 13 per cent larger than in the corresponding period of 1942 and 13 per cent larger than in the like period of 1941. Every one of the 17 States has reported larger sales this year than last, indicating the general nature of the increased demand for fertilizer.

FERTILIZER TAX TAG SALES

State	July 1943 Tons	July 1942 Tons	July 1941 Tons	% 1942	January–July 1943 Tons	January–July 1942 Tons	January–July 1941 Tons
Virginia	12,026	7,701	7,933	102	330,099	322,868	306,246
North Carolina	9,959	5,000	4,350	105	1,090,285	1,036,283	991,801
South Carolina	1,380	16,010	5,898	115	696,448	607,284	667,207
Georgia	12,768	4,499	1,783	120	872,075	728,380	743,879
Florida	39,318	28,310	31,594	116	459,464	396,978	365,853
Alabama	2,800	3,750	2,050	112	619,550	554,450	562,900
Mississippi	3,400	966	1,600	119	334,994	281,067	316,392
Tennessee	1,267	1,433	1,331	128	184,214	143,955	122,250
Arkansas	.....	108	500	110	140,975	127,958	112,500
Louisiana	1,900	700	50	107	144,438	135,036	147,410
Texas	2,325	1,300	415	119	130,235	109,303	117,476
Oklahoma	35	.....	505	206	15,088	7,311	9,380
Total South	87,178	69,777	58,009	113	5,017,865	4,450,873	4,463,294
Indiana	48,115	10,631	7,630	113	281,240	248,721	243,526
Illinois	1,837	.....	450	110	68,601	62,385	47,001
Kentucky	8,750	2,373	352	104	124,001	119,092	98,311
Missouri	7,120	1,010	1,768	138	50,816	36,860	38,071
Kansas	5,051	13	30	132	8,341	6,305	5,598
Total Midwest	70,873	14,027	10,230	113	532,999	473,363	432,507
Grand Total	158,051	83,804	68,239	113	5,550,864	4,924,236	4,895,801

FERTILIZER MATERIALS MARKET

NEW YORK

Ample Supplies of Chemical Nitrogen Available. Large Imports of Chilean Nitrate Urged. Handling of Ammonium Nitrate Found Difficult. Larger Production of Superphosphate Probable if Sulphuric Acid Is Available.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, August 25, 1943.

Inorganic Ammonia

As indicated previously, there should be ample supplies of inorganic ammonia for the coming season which opinion is more or less substantiated by the fact that the WPB has been requested by the War Food Administration to give its approval for the importation of one million tons of Chilean nitrate of soda for the coming year. It is very doubtful that such approval will be given as it is felt that, with the supply of ammonium nitrate available, it will be a problem where to find use for the nitrate supply. Unfortunately, fertilizer manufacturers, as previously advised, find the handling of ammonium nitrate somewhat difficult and when used for direct application by the individual farmer, it is feared that there may be a considerable effect on the new crops as farmers are inexperienced in the use of this higher test material. Sulphate of ammonia is being delivered regularly against contracts and allocations previously made.

Potash

Potash deliveries are being made regularly against contracts but some of the larger manufacturers are pressing for deliveries as there have been some reductions in expected early deliveries, possibly due to the allocation of certain quantities for export.

Superphosphate

It is expected that there will be a considerable increase in the production of this material, the total for the new year probably exceeding seven million tons but there is no indication as to how a total of nine million tons can be reached, which is the figure that has been urged by the War Food Administration. With sufficient rock available and even if the facilities for the manufacture of superphosphate were sufficient, there is no indication where the sulphuric acid could be found for the manufacture.

Organic Nitrogen

There is no change in this picture and fertilizer manufacturers are all short of organics with no indication that their needs can be met.

BALTIMORE

Between-Seasons Lull Continues. Feed Demand Takes Practically All Organic Ammoniates. Mixed Fertilizers Now Mostly Chemical.

Exclusive Correspondence to "The American Fertilizer"

BALTIMORE, August 24, 1943.

The usual between-season market lull is now on but manufacturers are more concerned than ever before about their supplies of raw material for another season. During the past season the tonnage produced was more nearly a strictly chemical fertilizer, due to the scarcity and shortage of organic ammoniates. The demand for feeding purposes continues heavy and, in fact, to such a degree that there are practically no packing house ammoniates obtainable for fertilizer purposes at all.

Sulphate of Ammonia.—With the distribution of liquid ammonia, ammonium nitrate, and sulphate of ammonia, it looks as though there is less danger of ammonia shortage than in the past, although business is now rapidly going to a strictly chemical basis due to shortage of other organic ammoniated material. Deliveries are now being made against contracts, and fertilizer manufacturers are storing up stocks for future use so as to have mixed goods on hand when ready and called for by their trade.

Nitrate of Soda.—There is no change in the situation but with improvement in shipping conditions it would not be surprising to see

larger tonnage of the Chilean product come into this country and be used in a larger way than heretofore to displace sulphate of ammonia.

Fish Meal.—Even though fishing on the Chesapeake Bay should continue good, small fleet fishing and heavy demand for feeding purposes will practically eliminate fertilizer manufacturers as an outlet for fish scrap and meal.

Superphosphate.—The situation is gradually tightening up and some producers are unable to allocate sufficient sulphuric acid to give them full production of superphosphate. The ceiling price of 64 cents per unit for run-of-pile remains firm and unchanged, with no early prospect of higher prices prevailing.

Potash.—Practically all the domestic production has now been sold up and deliveries are being taken regularly against contracts already booked.

Bone Meal.—Nothing new in the situation. Both raw and steamed bone meal continue scarce and are nominally quoted at $50.00 per ton, f. o. b. Baltimore for either raw or steamed grade.

Bags.—Up to the present time the OPA has not revised restrictions pertaining to the use of new burlap bags for fertilizer purposes, although in some quarters it is anticipated this action will be taken sooner or later as shipments of burlap start moving in better volume from Calcutta.

CHARLESTON

No Further Allocations of Nitrogenous. Imported Dried Blood Used by Feed Industry. Sulphuric Acid Shortage Expected.

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, August 24, 1943.

Nitrogenous.—There still are no further allocations of nitrogenous material, and no one at this time knows where the fertilizer manufacturers are going to get sufficient organic material.

Castor Pomace.—Though there has been an increased importation of castor beans which has stepped up the production of castor pomace, the opportunity to buy castor pomace has not improved.

Dried Blood.—There have been some recent arrivals of South American blood, but this has all gone into feed. Chicago market is unchanged, still $5.53 per unit of ammonia ($6.72 per unit N), f. o. b., Chicago.

Superphosphate.—The War Food Administration is urging an ultimate production of 9,000,000 tons of 18 per cent superphosphate, as compared with 7,600,000 tons formerly suggested, but apparently there is only in sight sufficient sulphuric acid to produce 7,200,000 tons.

Cottonseed Meal.—There is no change in this material. Prices on the 8 per cent grade are as follows: Georgia, $46.50; South Carolina, $47.00; North Carolina, $47.50; plus cost of bags at the mills.

Soybean Meal.—This material is priced at $45.00 in bulk, Decatur, Ind.

PHILADELPHIA

Summer Slow-Down in Evidence. Imported Ammoniates Taken by Feed Producers. Shipments on Materials Contracts Proceeding.

Exclusive Correspondence to "The American Fertilizer"

PHILADELPHIA, August 23, 1943.

Activity seems to have settled down in the past couple of weeks to almost routine matters, which may be due to mixers having already covered for what materials they could secure, plus the usual slowing down of all business during the summer months.

Ammoniates.—It is reported that some tankage and dried blood has come in from abroad, but, of course, most (if not all) of this will go to the feed trade. Even so, it

will probably take many more like shipments to satisfy the feeding demand. After that, perhaps the fertilizer industry will come in for their share. In the meantime, the fertilizer mixers find little or no ammoniates available.

Sulphate of Ammonia.—Shipments are apparently running at a satisfactory rate, and production rate is being maintained.

Nitrate of Soda.—Business in this material is now only a matter of routine, and the rut of routine is worn so smooth that little or no obstacles occur to report. Of course, this is due to its being allocated.

Superphosphate.—Stocks have increased, according to government reports.

Bone Meal.—Remains one of the scarce items, with only occasional odd lots turning up from time to time.

Potash.—Shipments of the material occupy the activities of the producers and sellers, and that is about all that can be said for activity in this item.

CHICAGO

Roll-Back in Nitrogeneous and Sludge Prices Considered by OPA. Feed Market Having Difficulty Filling Orders.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, August 23, 1943.

OPA has under consideration a rollback of nitrogenous and sludge prices, but no definite decision has been announced at this writing. Producers are protesting against such action, maintaining there would be a drastic reduction in production owing to the higher cost of material, labor, etc. Meanwhile, buyers are willing to accept any offerings made, while sellers remain on the side-lines, awaiting OPA's instructions.

Call for feed continues apace, with mixers finding much difficulty with labor and shortage of supplies.

No change in ceiling prices. High grade ground fertilizer tankage, $3.85 to $4.00 ($4.68 to $4.86 per unit N) and 10 cents; standard grades crushed feeding tankage, $5.53 per unit ammonia ($6.72 per unit N); blood, $5.38 ($6.54 per unit N); dry rendered tankage, $1.21 per unit of protein, Chicago basis.

TENNESSEE PHOSPHATE

Rains Relieve Long Drought. Crops Damaged by Hail. Lack of Man Power Hinders Shipments of Bagged Phosphate.

Exclusive Correspondence to "The American Fertilizer"

COLUMBIA, TENN., August 23, 1943.

A number of quite heavy rains and a few gentle soakers broke the worst drought ever experienced in some parts of the phosphate area and brought back some smiles to the faces of tobacco and alfalfa growers. However, corn that was not cut by the drought to fifty per cent of anticipated crop was damaged the rest of the way by hail and the few fortunate corn farmers are those who collected hail insurance for the crop.

Tobacco is all being topped and some is already being cut for the barn, with better prospects than recently expected, but suffering in quality from having to be cut too soon. Some more fortunately situated stands six feet high after topping and not a yellow leaf in the patch, which augurs, for the fortunate growers, the top of the market when the chant of the tobacco auctioneer fixes the price for the longer, the brighter, the mellower tobacco purchased by the makers of any one of your favorite cigarettes, together with a Merry Christmas.

Sellers and distributors of finely ground phosphate rock for direct application to the soil are crying for bagged goods as the farmers' favorite season for use of this material is under full sway. Producers are unable to get more than fifty per cent capacity because of inability to get laborers to take bags from the conveyor belt ends and stack same

in the cars. Now storage bins are full of ground rock and mills are idle some of the time. Where twenty-five years ago ninety per cent of these shipments went in bulk, the farmers' own labor troubles and realization of waste of fine product in bulk handling have reversed the situation and ninety-five per cent now is demanded in bags. The few who handle in bulk are getting shipments promptly, while bag shipments are far behind.

One large shipper, with a capacity increased to over 9,000 tons per month, is cut by the labor bottleneck to about 1,000 tons per week and customers are suffering accordingly. The Selective Service draft takes men in proportion to population, war plants draw away the best of labor, labor deferred for farming cannot change to this work without losing their deferment status, the U. S. Employment Service advertises for labor to go to other areas for war service aad other work, and the WMC cannot seem to give any relief.

The unions add to the trouble by their rules and the general run of men available for this rather hard and hot work are quite contented with two or three shifts per week at the high rate of pay in effect. Hundreds of thousands of dollars' worth of machinery installed to grind and bag and convey the phosphate to the car door stands waiting most of the time for lack of the absolutely necessary men to put the bags in place in the cars.

Potash Production Increases

The American Potash Institute, Inc., announces that deliveries of potash salts within the continental United States, Canada, Cuba, Puerto Rico, and Hawaii by the five major producing companies during the second quarter of the calendar year 1943 amounted to 298,909 short tons of salts, equivalent to 160,859 tons of actual K_2O. In this total there were, for agricultural use, 266,253 tons of salts, equivalent to 140,698 tons K_2O, made up of 204,025 tons of muriate, 26,047 tons of manure salts, and 36,181 tons of sulphates. For chemical use deliveries amounted to 32,656 tons of salts, equivalent to 20,161 tons of K_2O. These figures include salts of domestic origin only.

For the first half of 1943, deliveries of agricultural K_2O amounted to 305,485 tons, equivalent to 589,881 tons of potash salts, consisting of 438,671 tons of muriate, 87,184 tons of manure salts, and 64,026 tons of sulphates. In addition, deliveries for chemical use amounted to 61,877 tons of salts, equivalent to 38,214 tons of K_2O.

POTASH DELIVERIES

Short Tons K_2O

(United States, Canada, Cuba, Hawaii, Puerto Rico)

	Jan.–June 1942	Jan.–June 1942	Apr.–June 1943	Apr.–June 1942
Muriate.....	258,972	236,283	120,764	110,780
Manure Salts...	21,796	18,031	6,512	3,511
Sulphate and Sul. Pot. Mag.	24,717	24,905	13,422	11,216
Total Agri..	305,485	279,219	140,698	125,507
Chemical.....	38,214	33,528	20,161	17,148
Grand Total	343,699	312,747	160,859	142,655

Superphosphate Advisory Committee Meets

The first meeting of the Superphosphate Producers Industry Advisory Committee was held August 3rd with the following members of the industry present: H. B. Baylor, International Minerals and Chemical Corporation; L. H. Carter, The American Agricultural Chemical Company; A. H. Case, Tennessee Corporation; F. R. Dulaney, Southern States Phosphate and Fertilizer Company; R. A. Jones, Anaconda Copper Mining Company; R. L. King, Georgia Fertilizer Company; S. L. Nevins, Arkansas Fertilizer Company; L. W. Rowell, Swift and Company, Fertilizer Works. The purpose of the meeting was to consider:

1. Superphosphate requirements
2. Sulphuric acid production and requirements
3. 1943–44 superphosphate production
4. Manpower problems
5. Soil conservation program
6. Price problems

Speaking on superphosphate requirements for 1943–44, a representative of the War Food Administration urged that the Committee

should consider the ultimate production objective as approximately 9,000,000 tons rather than 7,600,000 tons which have been officially requested. Regarding sulphuric acid it was stated that the maximum supply in sight is sufficient to produce only approximately 7,200,000 tons of 18 per cent superphosphate. This maximum supply includes anticipated production of several ordnance plants very uneconomically located with respect to present acidulating plants, the utilization of which would require either the construction of additional superphosphate plants adjacent to the ordnance plants or the use of many additional tank cars to transport it to shortage areas.

In view of the urgency of the sulphuric acid situation the Committee recommended that (a) the acid produced in ordnance plants should be made available to the industry, (b) a certain number of tank cars should be allocated to transport such acid to shortage areas, (c) consideration should be given to the construction of additional chamber acid plants in the latter areas.

Members of the Committee stated that the labor problem is becoming serious, due to the general impression that the superphosphate industry is less essential than certain other war industries. It was agreed efforts would be made to further clarify the status of this industry as to essentiality.

W. G. Finn and D. W. Aitken discussed the superphosphate program of the Agricultural Adjustment Agency, stating that the Agency proposed to distribute any surplus production above that required by the fertilizer industry up to as high as 4,000,000 tons.

August Cotton Report

A United States cotton crop for 1943 of 12,588,000 bales of 500 pounds gross weight is forecast by the Crop Reporting Board of the United States Department of Agriculture, based upon information as of August 1st. Such a production would be less than the 1942 crop by 266,000 bales or 2.1 per cent, but 84,000 bales above average production during the 10-year (1932–41) period.

An all-time record United States average yield of 279.4 pounds is now indicated. Such a yield would be 7 pounds above the previous record yield of 272.5 pounds produced in 1942, and compares favorably with an average yield of 217.0 pounds.

In the southern part of the Cotton Belt, estimated yields are generally better than last year, but in the more northern areas it appears that the unusually high yields of 1942 will not be reached. Yields well above average, however, are indicated for all States excepting California and Arizona.

Weather conditions thus far have been generally good for growth and development of the cotton crop. Stands are unusually good and the season has been warm, with most areas free from excessive moisture.

The crop is generally earlier than usual, being from one week to two weeks early in most areas. As the result of floods in May and early June, the crop in Missouri and in parts of Oklahoma and Arkansas is somewhat later than usual.

Harvesting is progressing rapidly with the Census report showing ginnings to August 1st at 108,653 running bales from the crop of 1943, compared with 48,626 for 1942 and 1,969 for 1941.

	Production (Ginnings)[3] 500-lb. gross weight bales		
State	Average 1932–41 1,000 bales	1942 Crop 1,000 bales	1943 Crop Aug. 1 1,000 bales
Missouri	333	417	335
Virginia	29	34	28
North Carolina	606	727	695
South Carolina	760	699	740
Georgia	997	862	855
Florida	25	16	17
Tennessee	479	625	575
Alabama	1,014	925	920
Mississippi	1,530	1,968	1,980
Arkansas	1,298	1,485	1,300
Louisiana	618	593	710
Oklahoma	691	708	500
Texas	3,419	3,038	3,275
New Mexico	104	111	125
Arizona	170	193	143
California	384	402	340
All Other	18	21	20
United States	12,474	12,824	12,558

FERTILIZER ADVISORY COMMITTEE

(Continued from page 11)

and "B" crop classifications in FPO-5 be waived.

WFA reported that, exclusive of 40,000 tons of cottonseed meal, use of which as fertilizer has been approved, careful estimates indicate that the supply of organic nitrogen will probably be about 54 per cent of the 1941–42 consumption. The 40,000 tons of cottonseed meal bring the figure up to approximately 61 per cent. During the discussion it was pointed out that FPO-12 has not yet resulted in all manufacturers getting organic materials, the situation presenting special difficulty for those manufacturers who have depended on cottonseed meal, 40,000 tons of which would not be sufficient. The Committee voted that available organics should be distributed to each manufacturer on the same percentage basis, no consideration being given to any particular crop or crops. It was agreed that WFA would prepare a revision of FPO-12 and submit it to the Committee for consideration.

The subcommittee on revision of FPO 5 made a report recommending certain amendments to the order. This report was adopted with slight changes concurred in by the subcommittee: The Committee recommended (1) That changes be made in paragraph (i) (Applications) to conform its provisions to the letters from Dr. Groggins, WFA, to fertilizer manufacturers dated July 20 and August 2. (2) The Committee recommended that the definition of "rate of application per acre" [paragraph (a) (16)] be changed so that it will mean "total" pounds of fertilizer applied per acre," with a provision that where single-strength grades or multiple-strength grades are substituted, one for the other, the pounds of fertilizer shall be increased or decreased in accordance with the nitrogen, phosphoric acid, and potash content of the grades used and replaced. In this connection the Committee urged the use of grades recommended by the State Experiment Stations for the various crops, and expressed the hope that the proposed definition, if adopted, will not be used, because of its necessarily general character, as a basis for avoiding sound following of such recommendations. (3) The Committee concurred in the decision by WFA to add 0–14–4 and 2–14–4, the latter for fall seeded small grain only, to the approved grades for Kentucky and Tennessee. The Committee recommended the addition of 6–8–6 to the approved grades for Kentucky; the addition of 3–6–8 to the approved grades for Florida, with the understanding that the State Agricultural Fertilizer Committee which prepared the list would be asked to decide on one grade to be eliminated; the addition of 4–8–4 to the approved grades for Virginia, North Carolina, South Carolina, Georgia, Mississippi, Louisiana, and Texas; and the addition of "straight carriers of organic nitrogen, any grade" to the list of grades applicable to all States. The Committee disapproved requests that had been made to WFA for the addition to the approved grades of: 5–8–7 for certain Middle Atlantic States; 2–12–4 or 2–14–4 for Virginia; 3–12–6 and 4–12–4 for certain of the Middle Western States.

(4) As to victory garden fertilizer, the Committee recommended: That the present victory garden grades be retained as recommended grades for packages of all sizes and as mandatory grades for packages of less than 80 pounds; that the labeling requirements be continued for packages of less than 80 pounds; that in packages of 80 pounds or more any approved grade may be delivered, and that for such packages victory garden labeling be permitted but not required; and that the provisions for sale of 3–8–7 on hand July 1, 1943, and for the use on victory gardens of fertilizer obtained for other purposes, be retained. (5) As to specialty fertilizer, the Committee recommended that the language of paragraph (c) (1) be changed so as to permit each fertilizer manufacturer to manufacture one grade of mixed specialty fertilizer for sale in any particular State under his own brand and guarantee, and, in addition, to manufacture mixed specialty fertilizer to be registered and guaranteed under State law by another person (only one grade for any one person) who purchases it for resale under his own brand and guarantee, and to sell and deliver straight nitrogenous material and superphosphate as specialty fertilizer. (6)

The Committee recommended that hybrid corn for production of seed be included in the Group "A" crops; that paragraph (b) (3) should apply to other flowers, as well as to cut flowers; that starter solution fertilizers and fertilizer in pressed tablet form or completely soluble form be included with the other exemptions from the requirements for keeping delivery records in individual sales of less than 250 pounds; and a number of minor changes in the interest of clarification.

With respect to fertilizer for conservation crops, the subcommittee reported to the Committee that it did not have time to give the subject the careful and detailed consideration it merits, and so adopted the following:

"This subcommittee has considered the question of fertilizer for so-called conservation crops. The subcommittee recommends that fertilizer distributed for such use should be supplied only after requirements for food crops are filled. The subcommittee further recommends that fertilizer distributed for conservation purposes shall be handled through industry channels."

The Committee discussed the distribution and use of such fertilizer as may be available for food- and feed-increment crops. It was agreed that, following the discussion, WFA would prepare and submit to the Committee language, for inclusion in FPO-5, relating to fertilizer distribution for such purposes.

OPA representatives discussed their proposal for establishing overall dollars-and-cents maximum prices for fertilizer. They thought that the establishment of maximum prices on such basis—which would be in line with OPA general policy—would simplify the price structure for fertilizer manufacturers.

PUTTING FERTILIZER DOWN PUTS CROPS UP

(Continued from page 7)

equal to that where the fertilizer was plowed under as the data in Table IV indicate.

The plots with no fertilizer produced 40.8 bushels per acre, while those with 200 pounds of 0–20–0 plowed under produced an average of 47.1 bushels per acre, in contrast to a yield of 42.2 bushels where a similar application was applied in the row. An application of 200 pounds per acre of 0–20–20 plowed under yielded 49.4 bushels per acre, as compared to 46 bushels when applied in the row. By increasing the amount to 400 pounds per acre, the application plowed under did not increase the yield per acre.

Hesitancy in putting money into plant nutrients to be buried in the soil has made us use limited amounts of purchased fertilizer salts in close contact with the seed. This was encouraged by our desire to make little fertilizer do much and in short order. We have not been ready to look at fertilizer purchases as long-time investments, nor as carry-overs to the second, the third, and later crops. This shortsighted policy toward our soils has given us the apparent damaging salt effects of fertilizers in summer crops under serious moisture shortages.

TABLE IV

YIELDS OF CORN GRAIN (BUSHELS/ACRE) ON OSWEGO SILT LOAM ACCORDING AS FERTILIZER WAS PLOWED UNDER OR APPLIED ALONG SIDE OF THE ROW

Grade and Rate/Acre	Plowed Under	Along Row
None	40.8	40.8
200 lbs. 0–20– 0	47.6	42.2
400 lbs. 0–20– 0	46.7	....
200 lbs. 0–20–10	44.7	42.2
400 lbs. 0–20–10	48.1	....
200 lbs. 0–20–20	49.4	46.0
400 lbs. 0–20–20	49.4	....
333 lbs. 2–12– 6	48.7	41.2
666 lbs. 2–12– 6	47.1	....

If the effects of plowed-under fertilizers are a fair indication, as shown by the few trials, then they suggest that we must look to putting fertilizers onto the soil either long enough ahead of the crop, or down into the soil deep enough where there is enough moisture to permit them to change from the salt to the adsorbed form if the most regular benefits are to be obtained in spite of moisture irregularities.

In addition, in much of the humid area where the subsoil is so highly depleted of its nutrient bases as indicated by the high degree of acidity, the fertilizers will be much more efficient if used after the soil's calcium deficiency has been remedied by liming. Even a leguminous crop like soybeans, considered "acid-tolerant" by some, and the non-leguminous crop of corn have demonstrated this beneficial effect from lime in conjunction with fertilizer plowed under.

This greater economy in the joint use of more than one remedy for nutrient deficiencies and their wiser location in the deep and more moist areas of the soil at good distance from the seed can do much toward increased food supplies. They indicate that fertilizers are less effective as salts in solution than when first taken and later given by the soil to the plants, or when we fertilize the soil rather than fertilize the crop. We must in reality put the fertilizer down if we want to put the crops up to higher yield levels.

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BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, Including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

ACID BRICK
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

ACID EGGS
Chemical Construction Corp., New York City.

ACIDULATING UNITS
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

AMMO-PHOS
American Cyanamid Co., New York City.

AMMONIA—Anhydrous
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA LIQUOR
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA OXIDATION UNITS
Chemical Construction Corp., New York City.

AMMONIATING EQUIPMENT
Sackett & Sons Co., The A. J., Baltimore, Md.

AMMONIUM NITRATE SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

AUTOMATIC ELEVATOR TAKEUPS
Sackett & Sons Co., The A. J., Baltimore, Md.

BABBITT
Sackett & Sons Co., The A. J., Baltimore, Md.

BAGS AND BAGGING—Manufacturers
Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.
St. Regis Paper Co., New York City.
Textile Bag Mfrs. Association, Chicago, Ill.
Union Bag & Paper Corporation, New York City.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Textile Bag Mfrs. Association, Chicago, Ill.

BAGS—Paper
Bagpak, Inc., New York City
Bemis Bro. Bag Co., St. Louis, Mo.
St. Regis Paper Co., New York City.
Union Bag & Paper Corporation, New York City.

BAGS (Waterproof)—Manufacturers
Bemis Bro. Bag Co., St. Louis, Mo.
St. Regis Paper Co., New York City.
Textile Bag Mfrs. Association, Chicago, Ill.
Union Bag & Paper Corporation, New York City.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Wellmann, William E., Baltimore, Md.

BAG CLOSING MACHINES
Bagpak Inc., New York City.

BAGGING MACHINES—For Filling Sacks
Atlanta Utility Works, East Point, Ga.
Bagpak, Inc., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

BAG PILERS
Link-Belt Company, Philadelphia, Chicago.

BEARINGS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BELT LACING
Sackett & Sons Co., The A. J., Baltimore, Md.

BELTING—Chain
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BELTING—Leather, Rubber, Canvas
Sackett & Sons Co., The A. J., Baltimore, Md.

BOILERS—Steam
Atlanta Utility Works, East Point, Ga.

BONE BLACK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Huber & Company, New York City.

BONE PRODUCTS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.
Pacific Coast Borax Co., New York City.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Dickerson Co., The, Philadelphia, Pa.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Keim, Samuel L., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

BUCKETS—Elevator
Link-Belt Company, Philadelphia, Chicago
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind

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BUCKETS—For Hoists, Cranes, etc., Clam Shell, Orange Peel, Drag Line, Special; Electrically Operated and Multi Power
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

BURNERS—Sulphur
Chemical Construction Corp., New York City.

BURNERS—Oil
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CABLEWAYS
Hayward Company, The, New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.

CARS—For Moving Materials
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CARTS—Fertilizer, Standard and Roller Bearing
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

CASTINGS—Acid Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.

CASTINGS—Iron and Steel
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CEMENT—Acid-Proof
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

CHAIN DRIVES—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAINS AND SPROCKETS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAMBERS—Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CHEMICAL APPARATUS
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

CHEMICALS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.

CHEMICALS—Continued
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Phosphate Mining Co., The, New York City.
Wellmann, William E., Baltimore, Md.

CHEMICAL PLANT CONSTRUCTION
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

CLUTCHES
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CONCENTRATORS—Sulphuric Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CONDITIONERS AND FILLERS
American Limestone Co., Knoxville, Tenn.
Dickerson Co., The, Philadelphia, Pa.
Phosphate Mining Co., The, New York City.

CONTACT ACID PLANTS
Chemical Construction Corp., New York City

COPPER SULPHATE
Tennessee Corporation, Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

CRANES AND DERRICKS
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

CYANAMID
American Agricultural Chemical Co., New York City
American Cyanamid Co., New York City.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Jett, Joseph C., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

DENS—Superphosphate
Chemical Construction Corp., New York City.
Stedman's Foundry and Mach. Works, Aurora, Ind.

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DISINTEGRATORS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DRYERS—Direct Heat
Sackett & Sons Co., The A. J., Baltimore, Md.

DRIVES—Electric
Link-Belt Company, Philadelphia, Chicago

DUMP CARS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DUST COLLECTING SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELECTRIC MOTORS AND APPLIANCES
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ELEVATORS AND CONVEYORS—Portable
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ENGINES—Steam
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

EXCAVATORS AND DREDGES—Drag Line and Cableway
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link Belt Speeder Corp., Chicago, Ill., and Cedar Rapids, Iowa.

FERTILIZER MANUFACTURERS
American Agricultural Chemical Co., New York City.
American Cyanamid Company, New York City.
Armour Fertilizer Works, Atlanta, Ga.
Farmers Fertilizer Company, Columbus, Ohio.
International Minerals and Chemical Corporation, Chicago, Ill.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Wellmann, William E., Baltimore, Md.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GARBAGE TANKAGE
Wellmann, William E., Baltimore, Md.

GEARS—Machine Moulded and Cut
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GEARS—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

GELATINE AND GLUE
American Agricultural Chemical Co., New York City.

GUANO
Baker & Bro., H. J., New York City.

HOISTS—Electric, Floor and Cage Operated, Portable
Hayward Company, The, New York City.

HOPPERS
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

IRON SULPHATE
Tennessee Corporation, Atlanta, Ga.

INSECTICIDES
American Agricultural Chemical Co., New York City.

LACING—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Wellmann, William E., Baltimore, Md.

LOADERS—Car and Wagon, for Fertilizers
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Duriron Co., Inc., The, Dayton, Ohio.
Fairlie, Andrew M., Atlanta, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Coal and Ash Handling
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, East Point, Ga.
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind

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Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Pumping
Atlanta Utility Works, East Point, Ga.
Duriron Co., Inc., The, Dayton, Ohio.

MACHINERY—Tankage and Fish Scrap
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MAGNETS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

NITRATE OF SODA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
Chilean Nitrate Sales Corp., New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

NITRATE OVENS AND APPARATUS
Chemical Construction Corp., New York City.

NITROGEN SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Smith-Rowland Co., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PACKING—For Acid Towers
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

PANS AND POTS
Stedman's Foundry and Mach. Works, Aurora, Ind.

PHOSPHATE MINING PLANTS
Chemical Construction Corp., New York City.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Coronet Phosphate Co., New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Phosphate Mining Co., The, New York City.
Ruhm, H. D., Mount Pleasant, Tenn.
Schmaltz, Jos. H., Chicago, Ill.
Southern Phosphate Corp., Baltimore, Md.
Virginia-Carolina Chemical Corp. (Mining Dept.), Richmond, Va.
Wellmann, William E., Baltimore, Md.

PIPE—Acid Resisting
Duriron Co., Inc., The, Dayton, Ohio.

PIPES—Chemical Stoneware
Chemical Construction Corp., New York City.

PIPES—Wooden
Stedman's Foundry and Mach. Works, Aurora, Ind.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

POTASH SALTS—Manufacturers
American Potash and Chem. Corp., New York City.
Potash Co. of America, New York City.
International Minerals & Chemical Corp., Chicago, Ill.
United States Potash Co., New York City.

PULLEYS AND HANGERS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

PUMPS—Acid-Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

PYRITES—Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., New York City.
Wellmann, William E., Baltimore, Md.

QUARTZ
Charlotte Chem. Laboratories, Inc., Charlotte, N. C

RINGS—Sulphuric Acid Tower
Chemical Construction Corp., New York City.

ROUGH AMMONIATES
Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

SCALES—Including Automatic Bagging
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCRAPERS—Drag
Hayward Company, The, New York City.

SCREENS
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Including Vibrating
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Magnetic
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHAFTING
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHOVELS—Power
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corporation, Chicago, Ill., and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SPROCKET WHEELS (See Chains and Sprockets)

STACKS
Sackett & Sons Co., The A. J., Baltimore, Md.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Hydrocarbon Products Co., New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Freeport Sulphur Co., New York City.
Texas Gulf Sulphur Co., New York City.

SULPHURIC ACID
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M. Charleston, S. C.

SULPHURIC ACID—Continued
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City.
Armour Fertiliser Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SYPHONS—For Acid
Monarch Mfg. Works, Inc., Philadelphia, Pa.

TALLOW AND GREASE
American Agricultural Chemical Co., New York City.

TANKAGE
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Smith-Rowland, Norfolk, Va.
Wellmann, William E., Baltimore, Md.

TANKAGE—Garbage
Huber & Company, New York City.

TANKS
Sackett & Sons, Co., The A. J., Baltimore, Md.

TILE—Acid-Proof
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

TOWERS—Acid and Absorption
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

UNLOADERS—Car and Boat
Hayward Company, The, New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

UREA
DuPont de Nemours & Co., E. I., Wilmington, Del.

UREA-AMMONIA LIQUOR
DuPont de Nemours & Co., E. I., Wilmington, Del.

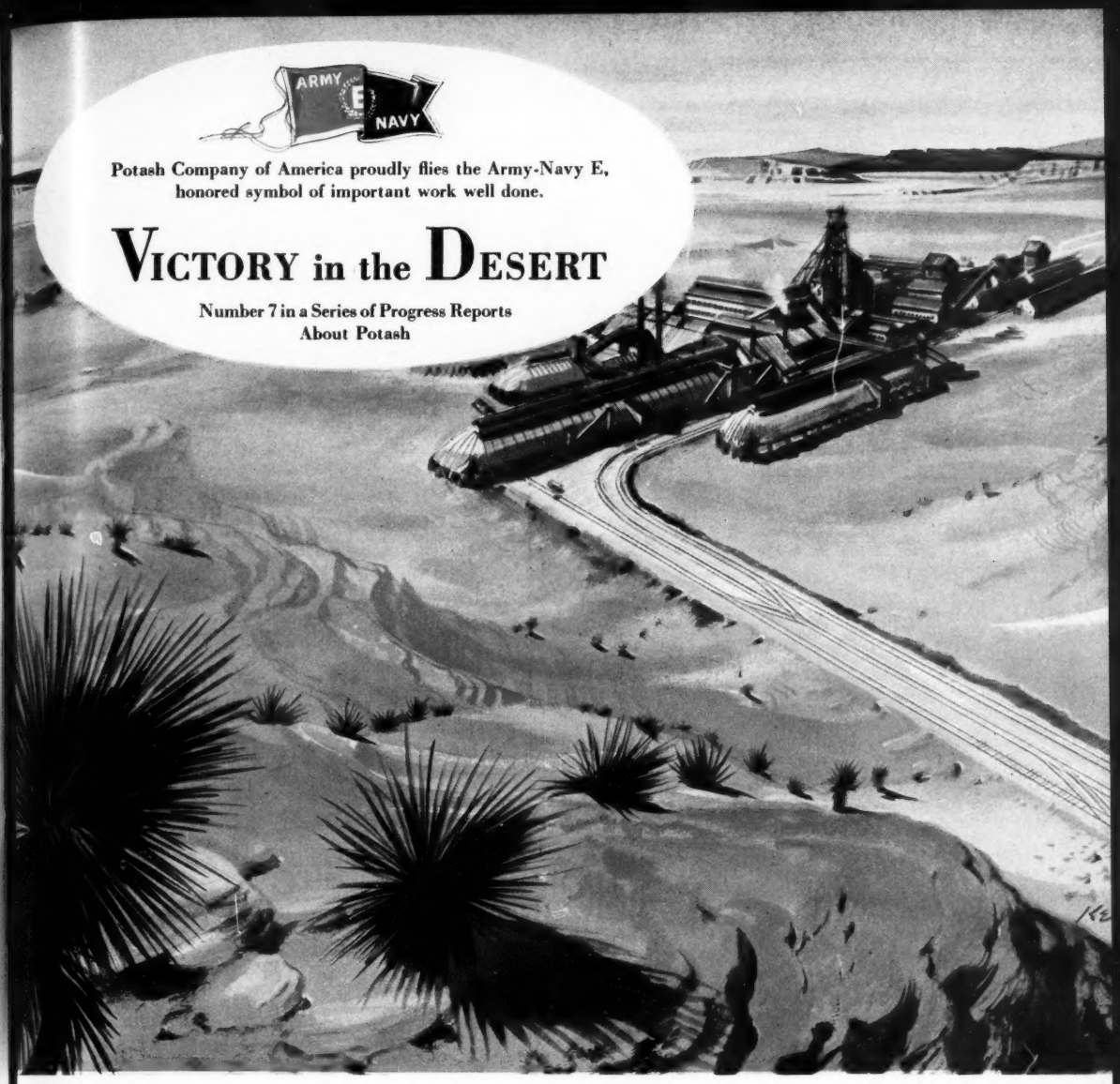
VALVES—Acid-Resisting
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

WHEELBARROW (See Carts)

ZINC SULPHATE
Tennessee Corporation, Atlanta, Ga.

ALPHABETICAL LIST OF ADVERTISERS

For Classified Index, see pages 28 to 32, inclusive



Potash Company of America proudly flies the Army-Navy E, honored symbol of important work well done.

VICTORY in the DESERT

Number 7 in a Series of Progress Reports About Potash

ARID LAND WHERE ONLY CACTUS GROWS...

Yes, this land looks worthless . . . useless . . . hopeless.

But it isn't. It is a battle-ground, the scene of an historic desert victory in the United States. Locked under layers of valueless "over-burden" is precious Potash which, thanks to the great desert victory, today is making it possible to meet war's huge needs of this important element both for agriculture and industry.

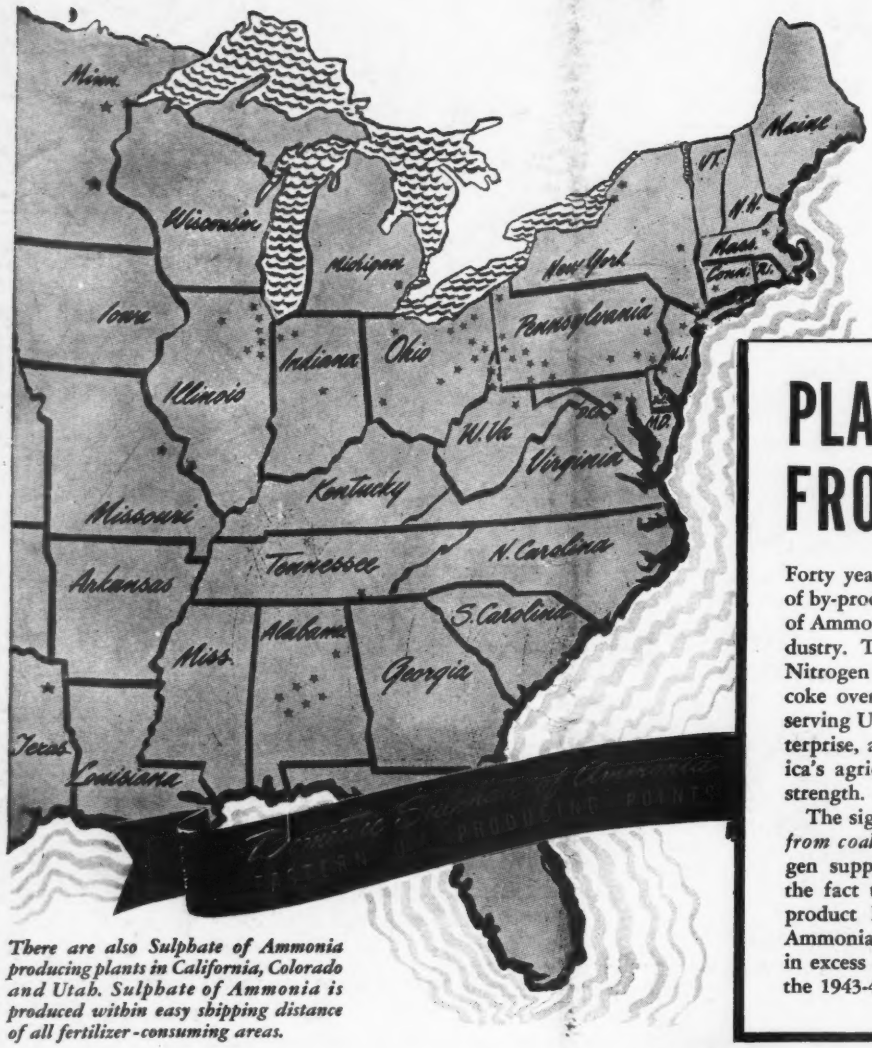
A great trainload of Potash leaves our Carlsbad, N. M. plant every day. Other producers also are working to the limit. Total annual available supply is over a million tons of refined grades. But all of this large production can't go to agriculture alone. Industry producing war goods has to have its share. That's why, great as this Potash victory has been, you may not be able to have all the Potash you need.

P.C.A. RED MURIATE

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

GENERAL SALES OFFICE...50 Broadway, New York, N. Y. • SOUTHERN SALES OFFICE...Mortgage Guarantee Building, Atlanta, Ga.



There are also Sulphate of Ammonia producing plants in California, Colorado and Utah. Sulphate of Ammonia is produced within easy shipping distance of all fertilizer-consuming areas.

PLANT FOOD FROM COAL

Forty years ago, the production of by-product Domestic Sulphate of Ammonia was by an infant industry. Today, the recovery of Nitrogen from coal by modern coke ovens – and by gas plants serving U. S. cities – is a vast enterprise, a vital source of America's agricultural and industrial strength.

The significance of *plant food from coal* to the wartime Nitrogen supply is demonstrated by the fact that production of by-product Domestic Sulphate of Ammonia is expected to be well in excess of 800,000 tons during the 1943-44 fertilizer year.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.
133 CARNEGIE WAY, ATLANTA 3, GA.

Barrett NITROGEN

HEADQUARTERS FOR AMERICAN-MADE NITROGEN

BARRETT NITROGEN SOLUTIONS ★ DOMESTIC SULPHATE AMMONIA ★ *ARCADIAN, THE AMERICAN NITRATE OF SODA
*REG. U. S. PAT. OFF.